# Novel Method of Synthesizing Polyethersulfone Membrane Containing Two Solvents and Lithium Chloride Additive and its Performance

## Abstract

The influence of a lithium chloride (LiCl) additive on poly(ether sulfone) (PES) membranes was investigated. A microwave technique was used to prepare membrane dope solutions, and two different types of solvent systems were used: single-solvent (SS) and double-solvent (DS) systems. In the SS system, PES was dissolved in *N*,*N*-dimethylformamide (DMF), and In the DS system, PES was dissolved in DMF and acetone. In the DS system, the control ratio of DMF to acetone was kept at 3.47, and the concentration of LiCl in both solvent systems was varied from 1 to 4 wt %. We observed that the microwave technique was able to dissolve the polymer rapidly, in less than 1 h. The performance of the PES membrane was evaluated in terms of poly(ethylene glycol) separation and molecular weight cutoff (MWCO). The results reveal that the presence of LiCl improved both the flux and rejection rates, and its concentration was best kept at 3 wt % for the tested conditions. In addition, we found that the mean pore size of the membranes produced from the DS system was smaller and the MWCO was lower as compared to the SS system.